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Science Standard 6.5.c.

Student Workbook

California Education and the Environment Initiative

Energy: Pass It On!

California Education and the Environment Initiative
Approved by the California State Board of Education, 2010

The Education and the Environment Curriculum is a cooperative endeavor of the following entities:
California Environmental Protection Agency
California Natural Resources Agency
Office of the Secretary of Education
California State Board of Education
California Department of Education
California Integrated Waste Management Board

Key Leadership for the Education and Environment Initiative:
Linda Adams, Secretary, California Environmental Protection Agency
Patty Zwarts, Deputy Secretary for Policy and Legislation, California Environmental Protection Agency
Andrea Lewis, Assistant Secretary for Education and Quality Programs, California Environmental Protection Agency
Mark Leary, Executive Director, California Integrated Waste Management Board
Mindy Fox, Director, Office of Education and the Environment, California Integrated Waste Management Board

Key Partners:
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http://www.calepa.ca.gov/Education/EEI/

Contents

Name: _____

Instructions: Complete the following tasks in the spaces provided.

1. List the three parts of the scientific definition of the word "population." (3 points)

   a. _____

   b. _____

   c. _____

2. Describe how the wolverine population in North America has changed during the past 200 years. (2 points)

   _____

   _____

3. Read the following prompts and complete the chart below about how other organisms affect the wolverine's population. (1 point per cell)
   Left column: List three populations of organisms that might affect wolverines.
   Middle column: For each of these, imagine that their populations increase. How would such a change affect wolverines? Write your prediction in the middle column.
   Right column: Explain why you think this would happen.

Populations of other organisms that affect wolverines	If the population in the left column increases, what might happen to the population of wolverines?	Why?

Name: _____

Instructions: For each reading, complete the name of the natural region the explorer studied. Next, identify examples of organisms that live in each region. Categorize each organism based on its role: producer, consumer (herbivore, carnivore, omnivore, scavenger), or decomposer. (1 point per cell)

Natural Region:		**High Desert**	**North Coastal Forests (Redwoods)**	**Oak Woodland**
Role in the Ecosystem		**Examples of Populations of Organisms**		
Producer				
Consumers	**Herbivores**			
	Carnivores			
	Omnivores			
	Scavengers			
Decomposers				

Name: _____

Instructions: Answer the following questions in the spaces provided. (2 points each)

1. What would happen to consumers if there were no producers?

2. What would happen if there were no decomposers?

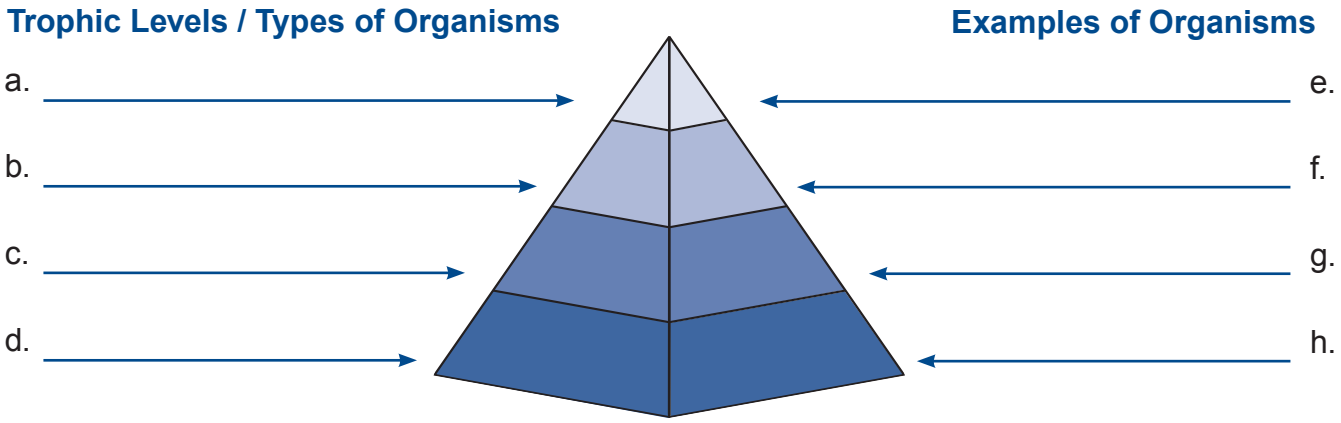
3. Why are people considered to be consumers?

Name: _____

1. Label the trophic levels of the energy pyramid below. Use the following terms in your labels in the left column. Some of the lines will need more than one term. (6 points)

primary consumer producer	secondary consumer herbivore	tertiary consumer carnivore

In the right column, give an example of an organism at each trophic level. (4 points)



Instructions: Answer the following questions in the spaces provided. (4 points each)

2. A certain amount of grass gets 10,000 kcal of energy from the Sun. How much energy will be available to the next trophic level? Explain how you got your answer.

_____

_____

3. Imagine you want to get 1 kcal of energy from a cow. How much energy would the cow need to get from plants? Why?

_____

_____

4. If you want to feed more people using the same amount of farm land, should you provide foods from lower or higher portions of the energy pyramid? Why?

_____

_____

_____

_____

Name: _____

Instructions: In your group, take turns presenting the **Human Practices Cards** to the group and leading a discussion. Ask, "How would this practice change the wolverine food web? Why?" After discussing each card, record your answers in the chart below. (2 points each)

Human practice	Prediction: How could this practice change the food web in the wolverine's ecosystem? Explain your reasons.
Hunting mountain lions	
Fire suppression	
Building dams	
Livestock grazing	

Name: _____

Human practice	Prediction: How could this practice change the food web in the wolverine's ecosystem? Explain your reasons.
Trapping wolverines	
Mining and development	
Burning fossil fuels	
Recreation	

Name: _____

Part 1: Timber Harvesting

Instructions: Read **Timber Harvesting** (Student Edition, pages 11–12) and use the information to complete the chart below and on the next page.

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system

Name: _____

Part 1: Timber Harvesting (continued)

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system

Part 2: Timber Harvesting

Instructions: Answer the following question in the space provided.

What is your recommendation regarding your scenario? Why? (4 points)

Name: _____

Part 1: Other Human Practices (1 point per cell; 18 total)

Instructions: Use information from one of the other readings: **Gravel Mining** (Student Edition, pages 13–14), **Mineral Mining** (Student Edition, pages 15–16), or **Rice Farming** (Student Edition, pages 17–18), to complete the chart below and on the next page.

Which human practice did you read about? _____

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system

Name: _____

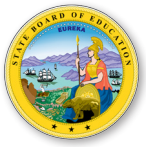
Part 1: Other Human Practices (continued)

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system

Part 2: Other Human Practices

Instructions: Answer the following question in the space provided.

What is your recommendation regarding your scenario? Why? (4 points)



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